

Writing to Learn in Agriculture And Natural Resources Courses

Leonora Smith, Jeffrey Charnley, and William McCall

While college faculty in scientific and technical disciplines feel a growing responsibility to help students write well in their subject areas, faculty in disciplines other than English often express qualms about including writing in their courses. The reasons for these reservations are not difficult to discern: they expect that responding to student papers is necessarily labor intensive, and--since they believe that responding means correcting grammar, punctuation, and mechanics--they also believe that using writing in their courses requires "English" expertise which they do not possess. They may also question whether or not time devoted to "writing" will interfere with students' subject matter learning.

In our experience, a writing program which helps faculty to identify and use their pre-existing strengths and talents as writers and teachers in their subject areas can lead to positive and lasting changes both in faculty attitudes toward student writing and in the amount and type of writing they incorporate into their courses. This is a lesson well-illustrated in our experience as writing specialists with the College of Agriculture and Natural Resources (CANR) at Michigan State University.

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Between December 1989 and March 1992, Project Write--a writing across the curriculum project initiated by the faculty of the College of Agriculture and Natural Resources and developed jointly with the Department of American Thought and Language (ATL)--reached over 4,500 students enrolled in CANR courses. CANR is one of the largest colleges at MSU and includes departments as diverse as Animal Science, Biochemistry, Fisheries and Wildlife, Packaging, and Parks and Recreation. The ATL department, where we normally teach, is largely responsible for freshman writing courses. Project Write (Writing Restored In Technical Education) grew out of a CANR self-study which identified the improvement of writing as a high priority for the College particularly in keeping with the land-grant mission of the university. As a result of this study, CANR contracted with two of us, Leonora Smith and Jeffrey Charnley, to coordinate an effort to improve the teaching of writing in their undergraduate and graduate courses through faculty development. With strong support from CANR Associate Dean Taylor Johnston and Assistant Dean Richard Brandenburg, a faculty task force made up of Professors Robert Deans (Animal Science), Clifford Jump (Agricultural Technology), Jeffrey Vincent (Forestry), and Frank Fear (Resource Development), initiated Project Write, which supported the development and implementa-

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assessed, and new courses of actions formulated. The survey results are being used to strengthen perceived weaknesses in the exercise. A domestic (US) version is also under consideration by instructors using the exercise.

A key to the successful implementation of "Green Revolution/Exaction" in agricultural economics courses at Oklahoma State University has been its integration with course material. Participants comprising the farm sector are drawn from the junior-level farm management course, while students from the agricultural policy course make up the urban and government sectors. Thus, students are able to draw from course material when reacting to their new roles. The debriefing session conducted at the conclusion of the game is also an important step in integrating the experience with course content. By writing a written report on various aspects of the "Green Revolution/Exaction" workshop, students are given a final opportunity to make the connection between course material and their role-playing experience.

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tion of innovative writing assignments through consulting services, faculty workshops, a graduate course in computer-assisted writing, a newsletter, and small grants awarded CANR faculty who would incorporate writing in their courses. One of these grants supported the third member of the Project Write team, William McCall, a graduate student from English. During its first two years of operation, 46 faculty members used ideas from Project Write to improve or add new writing assignments to their courses.

As a faculty-initiated program, Project Write responded to needs perceived by faculty rather than promoting a particular model for teaching writing. In practice this meant that we had constant contact with individual faculty members and assisted in developing strategies which met the instructional goals of the faculty member for his or her particular class. The question we constantly asked ourselves was not "how can we help students become better writers in general" but rather, "how can we help students learn, apply, and communicate the subject matter of this course." In other words, we were committed to the idea expressed by Janet Emig, Anne J. Herrington, and others,¹ that writing represents a powerful mode of learning, and that more than improving student writing *per se*, our task was to help CANR faculty develop writing assignments whose primary result would be an increasing student understanding of the course content. One of our suppositions, of course, was that as students began to use writing as a way of learning they would quite naturally become more proficient as writers, and this has been borne out in our experience; sixty-eight percent of the faculty who tried Project Write ideas observed improvement in student writing as a result of these writing assignments; 9% saw no improvement occur; and 21% were uncertain whether improvement occurred.²

After a fall "kick-off" workshop here at MSU in which Andrea Lunsford of Ohio State University spoke to faculty and administrators from CANR and ATL, we gave our own college-wide faculty workshop in which we summarized relevant research data, heard presentations from CANR faculty who were already using writing in their courses, and brainstormed with faculty as they identified points in their courses where writing seemed likely to improve student learning. The College then awarded seven grants to twelve faculty from six departments.

Writing Assignments

Assignments grew organically from this interaction. Some were simply revisions of assignments which had been in place for years; others were developed specifically as a response to the Project Write initiative. Because of the strong interest in teaching among the faculty of Agriculture and Natural Resources, many of the faculty who used Project Write services had already given serious thought to the nature and type of writing assignments suitable to their courses and their objectives, though they were sometimes less certain how the assignments might be implemented or evaluated. We found that assignments they developed through individual consulting usually fell into one of three often recognized categories--writing-to-learn, academic

and professional writing, and applied or "real-world" writing.³

Writing-to-learn assignments, as they defined themselves in the College of Agricultural and Natural Resources courses, were designed by faculty to help students think through or come to grips with their subjects by replicating the ways professionals use writing to think through problems in their own areas. A parks and recreation planner makes rough sketches which become a park. The close observer of human or animal behavior records observations in field notes which become the raw material for analysis. The experimental scientist creates a laboratory notebook. Writing-to-learn assignments used by CANR faculty included class and reading notes, field notes, records of observations, free writing before, during or after discussions, lab reports, and responses to course materials. The successful development of such assignments for this group of CANR faculty involved identifying the specific thought processes and skills required in the discipline, and in their particular courses, and considering how students come to learn them. Paul Nickel of Resource Development, for example, has developed a series of writing assignments which requires that students apply a series of critical "tests" for logic and evidence which require them to take a skeptical posture toward environmental claims.

Since the primary audience for such assignments is the writer her or himself, and since they are seldom edited for surface features such as grammar, punctuation or spelling, we suggested that such assignments be graded on a contract or pass/fail basis. At the time of the survey, over seventy-three percent of CANR faculty who tried Project Write ideas in their courses saw definite improvement in student learning of the subject matter (23% did not yet have enough evidence to decide; only four percent saw no improvement.)

Many CANR professors have had success with a dialectical journal format which asks students to respond in a journal entry to either lecture notes or readings by summarizing the main points and then responding to the content they record by noting their questions, associations and reactions on the other half of the page. In an Agriculture and Natural Resources Seminar, for example, questions posed to students took this form: "why is this information important; how is it related to your own experience; how is it related to previous information we have studied; what questions does it raise in your mind?" Such journal topics actively involve students with the subject matter by asking them to reflect upon it while allowing the teacher to monitor student comprehension and adjust instruction accordingly. A similar technique used in many science-oriented classes asks the students to put a complex concept into their own language by explaining it as though they were writing to their parents or a friend back home.

Academic and professional writing assignments created by the faculty reflected what most college students and professors think of when they think of "college-level writing": term papers, extended reports of research, theses and dissertations, and writing in other forms characteristic of specific disciplines. Of course, like writing-to-learn assign-

ments, such projects help students to apply, analyze, and integrate knowledge. However, these more formal assignments shift their emphasis from the learner/writer to a larger and more critical audience. Therefore, the assignments often emphasized disciplinary conventions, such as the type and amount of evidence required and the logical structures expected in a given field. They may also emphasize matters of style, form, and format such as the forms of citation a profession favors. And since such assignments are designed for others to read, thorough editing, revision, and proofreading are expected.

We found that innovative methods of incorporating academic and professional writing can encourage student learning without adding heavy grading burdens for faculty. Short, focused essays or articles targeted toward professional or lay publications are one effective way of teaching students the conventions of their profession. An assignment in a Natural Resource Economics course taught by Larry Leefers required students to examine three journals in their discipline in terms of audience, purpose, and format; the next assignment asked them to tailor a completed piece of writing to fit the demands of a particular journal. Abstracts, theses proposals, and review articles are other types of writing done by academics and professionals that are well-suited to the development of student learning. For example, students in Rick Bernstein's Agriculture and Rural Development in Developing Nations were asked to write abstracts of their own papers, and students in Rachelle Schemmel's Food Science course regularly write abstracts of journal articles germane to their subject. CANR faculty found that assignments of this sort increase student learning of subject matter while providing an opportunity for students to write in a professional way. They also found that the brevity of the assignments made them relatively easy to evaluate.

As many professors have discovered, collaborative projects are particularly useful in large classes where sheer numbers make it difficult for faculty to read individual papers by each student. In one large class--American Housing and Building Industry--the professor, Tim Mrozowski, usually spent the last week of each term barricaded in his office reading and responding to 180 term projects--one paper for each of his students. Finally, since work in his field is often of a collaborative nature, he developed a collaborative writing assignment which required groups of students to prepare a market analysis of housing for a local community which included reports on demographic, economic, employment, and land use trends. In addition to cutting his grading time in half, he found that his students became familiar with more material than they would have if working alone, since they read and edited each other's

work. Group projects such as this one are also becoming more popular with CANR faculty as they recognize how often that collaborative writing required in business, government, and other non-academic settings.

Applied or real-world writing assignments were designed by faculty to include forms which most students will be required to use in their work, such as letters, memos, feasibility reports, and proposals. Our faculty have become increasingly aware that employers judge and reward employees on the basis of their writing. The good news for both faculty and students is that most professionals write quite short pieces. According to one study, for instance, over half of the documents written in agriculture and engineering firms were a page or less, and 80% of the documents were four pages or less.⁴ Although these forms of writing are the common staple of technical writing courses, they have been used effectively in CANR courses to enhance student learning of the course content.

Real-world assignments succeed best when they identify the rhetorical context for the writing: the audience, the role the writer must play, the purpose of the writing, and often, the form the writing should take. In many cases, these differ significantly from the forms used in academic

situations. For instance, a team of Packaging faculty, led by Hugh Lockhart, was told by members of the school of Packaging's Industry Advisory Board that, in contrast to the traditional order of events for academic research reports and theses, work related reports in the field should *begin* with results and recommendations.

Another such applied assignment might ask a student to compose a memo to the professor summarizing the progress made on a collaborative project or, as is done in Larry Leefers' Forestry class, a proposal recommending a solution to a problem posed by the professor. In his Agribusiness Management course, Jack McEowen duplicated and distributed to his class an actual letter requesting advice that he had received from a president of a milling company. The assignment (written to them in business letter form and accompanied with elucidating documents) asked the students to write the businessman a letter recommending action he could take to increase sales.

Another real-world assignment, used in a Packaging--Selected Topics course taught by Diana Twede, and in a Park and Recreation Administration course taught by Ted Haskell, is an assimilation exercise called "In-Basket," which requires students to respond in writing to an "in-basket" full of materials that demand administrative decisions. These materials might include telephone messages, memos, letters, personal notes, and any other forms of communications typically found on an administrator's desk at the start of a morning. The student, who plays the role of an admin-

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istrator, must prioritize the material and create, based on class readings and lectures, appropriate responses.

Grading or Responding

Traditionally, grading and feedback in college classrooms have been given simultaneously--after the work is finished. Not surprisingly, current writing theory, which emphasizes helping students improve their writing rather than making fine distinctions among students encourages feedback earlier in the writing process.⁵ In our workshops and consultations, we presented ways of giving such feedback which does not necessarily entail more time on the part of faculty. Many have found that intervening at an earlier stage in the student's writing--during the outline, proposal, or rough draft stage, for instance--reduces the time spent grading since they are already familiar with the paper. In addition, feedback from sources other than the faculty can be built into assignments.

Whole-class feedback which focuses on a particularly effective (or ineffective) response to an assignment can alert a whole class to elements found in sound writing. Consequently, we encouraged professors of large classes to use an overhead to discuss the sample paper; in smaller classes copies of the paper were distributed to each student. Peer feedback, in which students read one another's papers in small groups or pairs, was also helpful, specially after a whole-class discussion where the professor had indicated what works and what does not. And self feedback which is based on a check list developed by the instructor allowed students to review, point by point, whether or not they had fulfilled all the requirements of the assignment.

When talking to faculty about grading, we emphasize that content instructors do not need to think of themselves as English teachers; that is, they do not need to focus their attention on the mechanics of writing. Alternatives to the traditional line-by-line editing of student papers (such as contract and portfolio grading) have demonstrated their effectiveness in helping students improve writing without creating an enormous drain on faculty time. Some CANR instructors who rely primarily on test scores (as Paul Nickel does in his large Water Resource Economics class) simply consider papers a "basic" requirement of the course: if the student completes them satisfactorily points are earned; if the student fails to complete them satisfactorily, no points are given. This pass/fail approach works well with writing-to-learn assignments, but may be used with more formal writing assignments as well.

Lessons and Future Directions

One principle germane to any content-based writing program is abundantly clear: without the ownership and interest of the faculty it serves, no writing program can succeed. We were particularly fortunate in working with the faculty of CANR, who were clearly interested in improving the writing skills of their students. They knew the importance of writing well, and some of them were clearly already talented writers and teachers of writing as it applied to their subject areas. For others, who were less confident of

their ability to teach writing effectively and efficiently, the encouragement they received from their colleagues and administrator sparked a talent they simply were unaware they had. As they and we discovered, non-English faculty are quite capable commentators on clarity of expression, use of support and evidence, logic and argument, style, usage, and form *as these elements of good writing influence successful communication in their own subject areas.*

Perhaps the most crucial lesson of Project Write has been that any content-area writing program must provide opportunities for faculty to share effective writing assignments with their colleagues. Over half of the CANR faculty who responded to our survey mentioned dissemination and exchange of ideas as the key element in Project Write's continuing success. In response to this sentiment, we not only arranged workshops for the exchange of knowledge among faculty but also produced the *Project Write Source Book*, a 93-page collection of successful assignments developed by CANR and other faculty for use in a wide array of course.⁶

We know that many faculty remain skeptical of their own ability to foster sound writing in their students. The goal of Project Write (and of Michigan State University's newly established Writing Center, with which we are now affiliated) continues to be the dissemination of information that combats the commonly held beliefs that content-area instructors are unprepared for the teaching of writing, that the teaching of writing necessarily entails extra work for the instructor, and that teaching writing necessarily lessens time spent on content material. Our work with CANR instructors clearly indicates that faculty working in various disciplines can help each other design and implement writing assignments that improve student learning and make teaching a more rewarding profession.

Notes

1. Janet Emig, "Writing as a Mode of Learning," *College Composition and Communication*, 28 (1977): 122-28; Anne J. Herrington, "Writing to Learn: Writing Across the Disciplines," *College English*, 48 (1981): 379-87; William F. Irmscher, "Writing as a Way of Learning and Developing," *College Composition and Communication*, 30 (1979): 240-44.

2. These and subsequent statistics are based on a March 1992 survey.

3. These three categories are based on Stephen Tchudi's *Teaching Writing in the Content Areas: College Level* (Washington, D.C.: National Education Association, 1986).

4. Laura E. Casari and Joyce T. Povlacs, "Practices in Technical Writing in Agriculture and Engineering Industries, Firms, and Agencies," *Journal of Technical Writing and Communication*, 18(1988): 153.

5. Tchudi 51-65; Richard Beach, "The Effects of Between-Draft Teacher Evaluation Versus Student Self-Evaluation on High School Students' Revising of Rough Drafts," *Research in the Teaching of English* 13 (1979): 111-19. George Hillocks Jr., *Research on Written Composition: New Directions for Teaching* (Urbana: NCRE, 1986) 167.

6. *The Project Write Source Book* is available from the Writing Center at Michigan State University, East Lansing, MI.



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